



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,821	05/27/2005	Andrew Douglas Bankhead	AMTH-101US	6629
23122	7590	12/26/2007	EXAMINER	
RATNERPRESTIA			HANSEN, JONATHAN M	
P O BOX 980			ART UNIT	
VALLEY FORGE, PA 19482-0980			PAPER NUMBER	
			2886	
			MAIL DATE	
			DELIVERY MODE	
			12/26/2007	
			PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/536,821

**Applicant(s)**

BANKHEAD, ANDREW DOUGLAS

**Examiner**

Jonathan M. Hansen

**Art Unit**

2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 104-123 and 125-127 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 127 is/are allowed.
- 6) ☒ Claim(s) 104-110, 115-117, 121-123, 125 and 126 is/are rejected.
- 7) ☒ Claim(s) 111-114 and 118-120 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 10/03/2007 have been fully considered but they are not persuasive.

In regards to the applicant's arguments that Deck fails to disclose an image enhancer operable to enhance image data representing a set of light intensity data to be displayed on a display to facilitate the detection by a user of the interference fringes, the Examiner respectfully disagrees.

It is noted by the Examiner that the computer, which is relied upon as the applicant's image enhancer, is disclosed to include one or more computer programs which is executed by a microprocessor of the computer to process the interference data.

Attention is now brought to lines 4-17 of column 9 and Figures 3A and 3B of Deck, wherein the interference data, which is acquired by the CCD (36), is represented as intensity curves, in Figure 3A, and contrast curves, in Figure 3B. Deck further discloses that the contrast curves are calculated from the intensity curves in a number of ways, all of which involve low pass filtering to eliminate the high frequency interference (col. 9, ll. 5-14). This is understood by the Examiner to be image enhancement due to the fact that the image data is being filtered to remove high frequency interference. Further, due to the facts that this filtering is part of a calculation and, as stated above, the computer includes one or more programs to process/calculate the interference data, Deck is

understood by the Examiner to disclose an image enhancer that enhances the acquired interference data.

In regards to the applicant's arguments that the monitor (42), shown in Figure 1 of Deck, is not disclosed to be connected to the computer, the Examiner respectfully disagrees.

It is first noted, that the claim language does not suggest or require the limitation of the monitor (applicant's display) being connected to the computer (applicant's image enhancer). The claim language states that the data is "to be displayed on a display", not that the data is directly displayed or that the display is directly connected to the image enhancer. Therefore, there was no requirement for Deck to disclose the monitor being connected to the computer to meet all of the claimed limitations.

However, Figure 1 does illustrate a connection between the computer and the monitor through the framegrabber. Wherein the framegrabber is viewed as a portion of the computer, due to the facts that it is controlled by the computer and saves data acquired by the CCD array. Also, in view of the monitor shown in Figure 1 and the disclosure of the "profile being displayed in a conventional fashion" (col. 10, ll. 29-30), Deck is understood to disclose the displaying of the profiles, which are calculated/enhanced by the computer, on the monitor shown in Figure 1.

It is further noted, that the drawings are schematic in nature and therefore represent only a diagram of the elements in Deck, to be used to aid in comprehension of the invention.

In regards to the arguments that the secondary references to Ai and Webster do not overcome the deficiencies of Deck, attention is brought to the discussion above. Wherein it is shown that Deck does disclose an “image enhancer to enhance image data” and therefore renders the arguments to Ai and Webster irrelevant.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims **104-107, 115, 121-123, 125 and 126** are rejected under 35 U.S.C. 102(b) as being unpatentable by **US Pat. # 5,953,124 to Deck**.

With regard to claims **104 and 126**, Deck discloses a surface profiling apparatus for obtaining surface profile data for a sample surface, the apparatus comprising:

a light director (col. 7, ll. 15; fig. 1, 22);

a mover (col. 7, ll. 24; fig. 1, 32); a sensor (col. 7, ll. 46; fig. 1, 36);

a data processor (col. 7, ll. 61-65; wherein the microprocessor of the computer is viewed as the processor); and

a surface profiler (col. 7, ll. 65 to col. 8, ll. 30; the 3D interferogram of line 26 is viewed as the generated surface profile.);

the apparatus further comprising an image enhancer (col. 7, ll. 61-65; wherein the computer is viewed as the image enhancer that is connected to a display.).

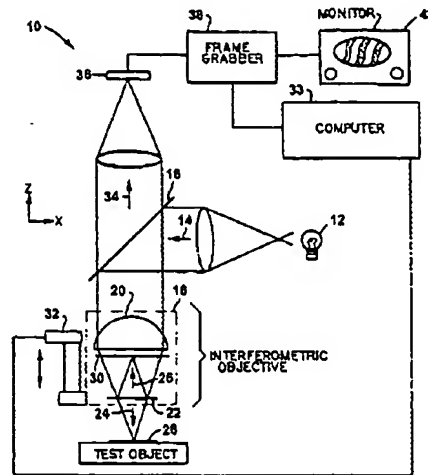


FIG. 1

As to claim 122, the claimed method merely discloses the steps performed by the device; the method would be inherent in view of the device.

As to claims 105, 106 and 107, Deck discloses an apparatus, wherein the image enhancer comprises a gradient determiner or a contrast determiner operable to determine from a set of light intensity data light intensity gradient data or contrast difference data and a modifier operable to modify the image data to be displayed in accordance with the determined gradient data (col. 7, ll. 61-65; wherein the computer is viewed as the image enhancer and the framegrabber is viewed as the modifier. Also, Col. 5, ll. 29-50; wherein the height determination and contrast determination are done within the computer.).

As to claim 115, Deck discloses an apparatus, further comprising a user operable device that enables a user to select the reference set (col. 10, ll. 18-30; wherein the reference pixel is selected within the computer. It is inherent that computers have controllers to make them user operable.).

As to claim 121, Deck discloses an apparatus, further comprising a surface form extractor (col. 7, ll. 65 to col. 8, ll. 30; wherein the surface form extractor is viewed as the same as a surface profiler.).

As to claim 123, Deck discloses a method, further comprising determining from the positions at which the predetermined feature occurs in the light intensity data for the different sensed regions the relative surface heights of the different sensed regions to provide a surface profile (col. 5, ll. 40-43).

As to claim 125, Deck discloses a storage medium carrying processor-implementable instructions for causing processor means to carry out a method (col. 7, ll. 61-65; wherein the computer contains a storage medium for the executable software.).

The recitation of the functional language following “operable to” of each structural element is only a statement of the inherent properties of each claimed element. The structure recited in Deck is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are

produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims **108-110** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Deck**, and in view of **US Pat. 5,471,303 to Ai et al.**

As to claims **108 and 110**, Deck further discloses the pixels are in the x-y plane and use x-y coordinates (col. 8, ll. 50-51). Deck substantially discloses the claimed invention however, he differs from the limitations of claims 108 and 110 in that he does not explicitly disclose comparing the light intensity data values associated with regions on either side of the region that provided the light intensity data value.

Ai teaches the determination by reference to a region or a plurality of adjacent pixels (col. 10, ll. 35-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Deck to compare adjacent regions for the advantages of very consistent and repeatable height measurements, as taught by Ai.



As to claim **109**, Deck substantially discloses the claimed invention however, he differs from the limitations of claim 109 in that he does not explicitly disclose an apparatus, wherein the regions are arranged in a rectangular array.

Deck discloses a square CCD array (col. 7, ll. 40-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the square CCD of Deck into a rectangular array for the advantages of having a larger imaging area.

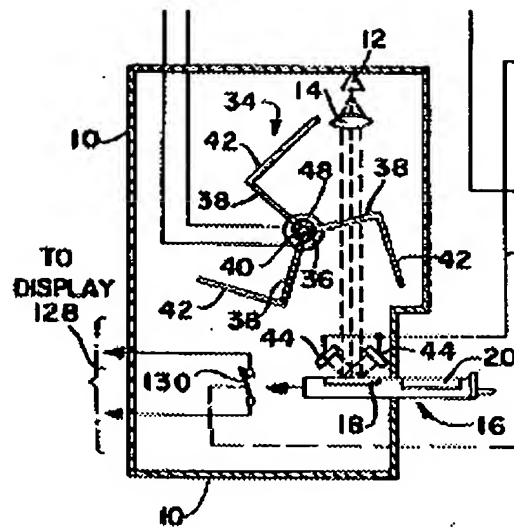
The recitation of the functional language following “operable to” of each structural element is only a statement of the inherent properties of each claimed element. The structure recited in Deck is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

5. Claims **116 and 117** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Deck** as applied to claim 104 above, and further in view of **US Pat. 4,040,747 to Webster**.

With regard to claims 116 and 117, Deck substantially discloses the claimed invention however, he differs from the limitations of claims 116 and 117 in that he does not explicitly disclose an apparatus, wherein a filter assembly mounted in a light path from the light source and having a housing having a filter carrier mounted in the housing so as to be rotatable about an axis, the filter carrier having a plurality of filters spaced around the axis and having a peripheral surface provided with land portions each associated with a corresponding filter and each distinguishable by a user for allowing a user to rotate the filter carrier to bring a selected filter to a predetermined position.

Webster teaches and shows in Figure 1 (shown modified below) a multiple filter assembly in the form of a paddlewheel that is rotatable about an axis (col. 4, ll. 1-11). The figure below shows a filter assembly (fig. 1, 34) mounted in a light path from the light source (fig. 1, 12) and having a housing (fig. 1, 10) having a filter carrier mounted in the housing so as to be rotatable about an axis (fig. 1, 40), and the filter carrier having a plurality of filters spaced around the axis (fig. 1, 38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Deck to include a rotatable filter assembly for the advantages of sweeping the frequencies of the light source, as taught by Webster.



*Allowable Subject Matter*

6. Claim 127 is allowed.

As to claim 127, the prior art of record, taken alone or in combination, fails to disclose or render obvious a reference calibrator operable to calibrate the apparatus to compensate for surface features of the reference surface, the reference calibrator comprising: a user operable calibration initiator operable to initiate a calibration; a calibration controller operable to cause, in response to operation of the calibration measurement initiator, operation of the controller, data processor and surface topography determiner to carry out a number of calibration measurement operations to obtain in each calibration measurement operation calibration surface topography data for the calibration sample, in combination with the rest of the limitations of the claim.

7. Claims **111-114 and 118** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claim **111**, the prior art of record, taken alone or in combination, fails to disclose or render obvious the modifier is operable to determine a modified intensity data value  $IM$  for a light intensity data value  $I$  associated with the region at coordinates  $x, y$  in accordance with:  $IM = 64 + V2 + (I-i - I+i)X4$  where  $I+1$  and  $I-1$  are the intensity data values associated with the regions at coordinates  $x+1, y+1$  and  $x-1, y-1$ , respectively, in combination with the rest of the limitations of the claim.

As to claim **112**, the prior art of record, taken alone or in combination, fails to disclose or render obvious the contrast determiner is operable to means is arranged to determine the contrast difference data by subtracting from the intensity data value  $I$  of the set the corresponding intensity data value  $IR$  of the reference set, in combination with the rest of the limitations of the claim.

As to claim **113**, the prior art of record, taken alone or in combination, fails to disclose or render obvious the modifier is operable to determine a modified intensity data value  $IM$  for a light intensity data value  $I$  in accordance with:  $IM = 64 + 1/2 + (I - IR)X4$  where  $IR$  is the corresponding intensity data value of the reference set, in combination with the rest of the limitations of the claim.

As to claim 114, the prior art of record, taken alone or in combination, fails to disclose or render obvious the modifier is operable to determine a modified intensity data value  $IM$  for a light intensity data value  $I$  associated with the region at coordinates  $x,y$  in accordance with:  $IM = 64 + 1/2 + (I - IR) \times 4 + (I-i - I+i) \times 4$  wherein  $I+i$  and  $I-l$  are the intensity data values associated with the regions at coordinates  $x+l, y+l$  and  $x-l, y-l$ , respectively, and  $IR$  is the corresponding intensity data value of the reference set, in combination with the rest of the limitations of the claim.

As to claim 118, the prior art of record, taken alone or in combination, fails to disclose or render obvious the image enhancer is operable to cause the majority of the light intensity data values to appear to be represented by a single color with the apparent lightness of the color varying with the light intensity data value such that the lightness either increases or decreases with increase in the light intensity data value and to cause at least one of a light intensity data value representing a highest light intensity, a light intensity data value representing a lowest light intensity and light intensity data values representing midrange light intensities to be displayed so as to appear to be of a different color to enable the user to identify the light intensity level represented by that light intensity data value, in combination with the rest of the limitations of the claim.

### *Conclusion*

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan M. Hansen whose telephone number is 571.270.1736. The examiner can normally be reached on Monday through Friday 8:30AM to 6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on 571.272.2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMH



TARIFUR CHOWDHURY  
SUPERVISORY PATENT EXAMINER